DOCKET NO. 4004-013-30

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Yvan NOVIS, et al. ART UNIT: 1771
SERIAL NO.: 09/719,141 EXAMINER: Andrew T. Piziali
FILING DATE: February 12, 2001
FOR: TRANSPARENT SUBSTRATE COATED WITH A SILVER DEPOSIT

APPELLANTS' BRIEF ON APPEAL UNDER 37 CFR 1.192

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SIR:

This is an Appeal from the decision of the Primary Examiner mailed August 4, 2003. In accordance with 37 CFR 1.192, this Brief, along with the Appendix, is filed in triplicate and is accompanied by the required fee. The Notice of Appeal was timely filed January 5, 2004. The Appellants' Brief on Appeal, accompanied by a Petition for Extension of Time (with Fee) is timely.

I. REAL PARTY IN INTEREST

The real party in interest is the Assignee of the above-captioned application, Glaverbel.

II. RELATED APPEALS AND INTERFERENCES

There are no appeals or interference's which will be directly affected by, will directly affect, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 25-71 are currently pending.

The rejections of record of Claims 25-71 are appealed. Claims 25-71 are set forth in the attached Appendix.

IV. STATUS OF AMENDMENTS

No amendments have been made subsequent to December 29, 2003. The Notice of Appeal was filed January 5, 2004.

V. SUMMARY OF THE INVENTION

Appellants' claimed invention relates to a transparent substrate carrying a coating stack for example having the structure: transparent substrate/dielectric coating layer/metallic coating of silver or silver alloy/dielectric coating layer, and particularly to the use of dielectric coating layers comprising a sub-layer based on a partially but not totally oxidized combination of at least two metals.

One application of products in accordance with the invention is for glazing panels, for example for architectural use, or for incorporation in a laminated glazing, particularly to form a vehicle windshield.

VI. ISSUES

The issues in this Appeal are:

1 – Are the interpretation of the Guiselin document as set forth in the Final Rejection, and the Final Rejection based on that interpretation, correct?

2 – Are the interpretation of the Hartig document as set forth in the Final Rejection, and the Final Rejection based on that interpretation, correct?

Appellants contend the answer to each question to be no.

VII. GROUPING OF CLAIMS

Because of the nature of the various rejections, any "grouping" of claims must be based on the various rejections and thus is set forth in the Statement of The Argument.

VIII. STATEMENT OF THE ARGUMENT

A. Overview

Without intending to interpret the claims or limit the scope of the claims, and purely for the purpose of putting the argument in context, the disagreement between Appellants and the Office relates to Appellants' dielectric coating layers, which comprises a sub-layer based on a partially but not totally oxidized combination of at least two metals. Independent Claim 25 indicates that each dielectric layer which is defined comprises a sub-layer based on a partially but not totally oxidized combination of at least two metals, prior to a possible (but not necessary) heat treatment of the coated stack. (Emphasis added.) Other independent claims are sufficiently broad to encompass the coating stacks both before and after the coating stack is heat treated.

The Official Action has identified a possible layer (no reference number) in the Guiselin document (called a bonding film) between a dielectric layer 2 and a silver layer 3, as a "sub-layer" which purportedly corresponds to Appellants' Claims. The Official Action has identified a layer 103 (Figure 3) in the Hartig document, as being the "sub-layer" which purportedly corresponds to Appellants' Claims. Thus these layers in the Guiselin and Hartig documents are the layers which are under consideration.

With respect to the Guiselin document, it is Appellants' contention that there is no disclosure of a layer between the dielectric layer 2 and the silver layer 3 which is partially but not totally oxidized. With respect to the Hartig document, it is Appellants' contention that there is no disclosure that the layer 103 (Figure 3) is partially but not totally oxidized.

B. The Rejection of Claims 25-29, 31, 34-35, 43, 46, 52-56 and 61-65 as Anticipated by Guiselin is Improper and Should be Reversed.

Claims 25-29, 31, 34-35, 43, 46, 52-56 and 61-65 were rejected as anticipated by Guiselin (U.S. Patent No. 5,595,825) pursuant to 35 U.S.C. § 102(b). Within this specific rejection there are two "groups" of claims.

1. Claims 25-29, 31, 34-35, 43 and 46.

If, but only if, the rejection in the Final Official Action based on this reference and Section 102(b) is affirmed without any change whatsoever in the language as set forth in the Final Official Action and there is no rejection on any other basis, then solely for the purpose of administrative convenience in this Appellate proceeding, and without prejudice to Appellants' right to proffer reasons in support of the separate patentability of any other claim in this group at any other time, Claims 25-29, 31, 34-35, 43 and 46 are a first group and this Board's decision on Claim 25 (which is the independent Claim) will be applicable to all Claims in this first group.

The Guiselin document discloses a substrate (1) carrying a coating stack comprising dielectric layers (2, 4, 6, 8) such as tin oxide deposited in an argon/oxygen atmosphere (Guiselin, col. 5, line 28) interleaved with metal layers or films 3, 5, 7 (e.g., silver films) deposited in an argon atmosphere. (Guiselin, col. 5, line 25). Guiselin discloses that it is preferable to cover each of the films having infrared reflection properties (i.e., the silver films in the stack) with a fine metallic barrier film. (Guiselin, col. 4., lines 30-38) Guiselin also discloses that it is possible to deposit some or all films having infrared reflecting properties onto a fine bonding film. (Guiselin, col. 4, lines 40-54)(Emphasis added). The preferable barrier films and the possible bonding films may be based on Ni-Cr. It should be noted that Guiselin does not give any specific examples of stacks which use both barrier films and bonding films. The example described with reference to the Guiselin Figure has barrier films of Ni-Cr deposited in an argon atmosphere. (Guiselin, col. 5,

line 38) but does not having bonding films.

When combining the example described with respect to the single Figure of Guiselin with its comment at col. 4, lines 40-54 that it is possible to have a bonding film, it is possible for the reader to conjure up, derive or imagine a stack where it is possible to deposit a first Ni-Cr layer bonding layer between the illustrated dielectric 2 and metal layer 3 of the Figure. Since this bonding layer would be deposited in an argon atmosphere, there would be no oxidation of the Ni-Cr layer. Then metal layer 3 would be deposited in an argon atmosphere. Again, no oxidation of the Ni-Cr layer. Next, another Ni-Cr layer would be deposited (in an argon atmosphere) above metal layer 3. No oxidation. Finally, dielectric 4 would be deposited over the Ni-Cr layer in an argon/oxygen atmosphere. It is possible that there would be some oxidation of this specific Ni-Cr layer above the metal layer as suggested by Guiselin at col. 4, lines 38-39.

But, Guiselin fails to disclose partial oxidation of any possible Ni-Cr layer below the metal layer 3.

Independent Claim 25 states, *inter alia,* "...each of the dielectric coating layers comprises a sub-layer based on a partially but not totally oxidized combination of at least two metals". (emphasis added) This is not disclosed by the Guiselin document. Rather, according to the rejection (Final Office Action, Paper No. 15, mailed August 4, 2003)

> Guiselin discloses a transparent substrate carrying a coating stack comprising at least one metallic coating layer comprising silver or a silver alloy, in contact with two non-absorbent transparent dielectric coating layers characterized in that prior to a heat treatment the dielectric coating layers comprise a layer based on a partially but not totally oxidized combination of nickel and chromium (column 2, lines 25-39, column 4, lines 30-54 and Figure 1). Guiselin discloses that NiCr layers may be placed both over and under each silver layer and further discloses that upon depositing the dielectric layers on the NiCr layers, in the presence of oxygen, the NiCr layers become partially oxidized (column 4, lines 30-54). Regarding claim 29, Guiselin discloses that dielectric films may be tin or tantalum oxide (column 2, lines 49-59 and Figure 1). (emphasis added)

However, this interpretation of the reference and the rejection are incorrect. Guiselin, at

the cited portion of column 4 (lines 36-39), states: "These barrier films protect the underlying films, particularly metal films, from contact with the oxygen by partially oxidizing themselves" (emphasis added). Column 4, at lines 49-54 indicates: "The presence of the barrier and/or bonding films enable the [Guiselin] invention stack of thin films as a whole to more effectively resist later thermal treatments which the carrying substrate may have to undergo, i.e., annealing, bonding or toughening". Nothing is said in the Guiselin document about partial oxidation of the Ni-Cr layer beneath the metal film which is deposited in an argon atmosphere. Thus there is no disclosure and no teaching that "each of the dielectric coating layers comprises a sub-layer based on a partially but not totally oxidized combination of at least two metals".

Both the interpretation of the reference and the rejection are incorrect and can not be properly maintained.

2. Claims 52-56 and 61-65.

Claims 52-56 and 61-65 were rejected on the same basis as Claims 25-29, 31, 34-35, 43 and 46. Again, if, but only if, the rejection in the Final Official Action based on this reference and Section 102(b) is affirmed without any change whatsoever in the language as set forth in the Final Official Action and there is no rejection on any other basis, then solely for the purpose of administrative convenience in this Appellate proceeding, and without prejudice to Appellants' right to proffer reasons in support of the separate patentability of any other claim in this group at any other time, Claims 52-56 and 61-65 are a second group, and this Board's decision as to Claim 52, which is an independent claim, will be applicable to all Claims in this second group.

One difference between Claim 25 and Claim 52 is that Claim 25 refers to the glass substrate and coating stack prior to heat treatment while Claim 52 is sufficiently broad to encompass the coating stacks both before and after the coating stack is heat treated.

With respect to the Guiselin document, there is no teaching as to what occurs to each of

the Ni-Cr layers after the stack is subjected to thermal (heat) treatment. (Guiselin, col. 4, lines 48-54). If Claim 52 is considered with respect to the stacks disclosed in Guiselin prior to any heat treatment, the rejection is improper for the same reason as the rejection of Claim 25 is improper, i.e., there is no disclosure of partial but not total oxidation of the sub-layer beneath each metal layer. If Claim 52 is considered with respect to the stacks disclosed in Guiselin one such stacks have been subjected to a heat treatment, there is no teaching as to whether there is partial but not total oxidation of the sub-layer beneath the metal layer and no disclosure as to whether the top-most Ni-Cr layer in the device according to the Guiselin document is partially or totally oxidized. The language of Claim 52 is directed to a coating stack comprising, in order from the glass substrate:

> a non-absorbent transparent coating layer comprising a layer of a partially but not totally oxidized combination of at least two metals;
>
> a metallic coating layer selected from the group consisting of silver and silver alloys;
>
> a non-absorbent transparent coating layer comprising a layer of a partially but not totally oxidized combination of at least two metals.

Since there is no disclosure in Guiselin of partial but not total oxidation of the Ni-Cr layer beneath the silver layer, the rejection can not be maintained.

C. Rejection of Claims 25-28, 31-35, 43, 46,49-57 and 61-66.

The rejection of Claims 25-28, 31-35, 43, 46,49-57 and 61-66 as anticipated by Hartig (U.S. Patent No. 5,584,902) pursuant to 35 U.S.C. § 102(b) is improper and should be reversed.

If, but only if, the rejection in the Final Official Action based on this reference and Section 102(b) is affirmed without any change whatsoever in the language as set forth in the

Final Official Action and there is no rejection on any other basis, then solely for the purpose of administrative convenience in this Appellate proceeding, and without prejudice to Appellants' right to proffer reasons in support of the separate patentability of any other claim in this group at any other time, Claims 25-28, 31-35, 43, 46, 49-57 and 61-66 may be considered as a single group and this Board's decision as to Claim 25, which is an independent claim, will be applicable to all Claims in this group.

With reference to Hartig Figure 3, there is a coating stack on a glass substrate G. The stack includes dielectric layers (silicon nitride layers 101 and 109) and a metal layer (e.g., silver layer 105). On each side of the silver layer there is a nickel or nichrome layer (103, 107). The rejection is as follows:

> Hartig discloses a transparent substrate carrying a coating stack comprising one metallic coating layer comprising silver, in contact with two non-absorbent transparent dielectric coating layers, characterized in that prior to heat treatment, each of the dielectric coating layers comprises a layer based on a partially, but not totally oxidized, combination of nickel and chromium. (column 9, lines 10-22 and column 10, lines 33-38).

Hartig at column 9 lines 10-22 refers to the layer in question being nickel or nichrome. Hartig at column 10, lines 33-38 describes the nickel or nichrome layers (and the silver layer) as being deposited in an atmosphere of either 100% argon or 95% argon/5% oxygen. (Hartig, column 10, lines 33-38).

Appellants' disagreement with the rejection is based on the teaching of the Hartig document as interpreted in the Official Action. Where is there a teaching in the Hartig document that <u>each</u> nickel layer or nichrome (i.e., Ni-Cr) layer (103, 107) will be partially but not totally oxidized? There is no such teaching!

During an interview, the Examiner kindly referred to Hartig, at column 8, line 65 through column 9, line 6, as support for the position of the Office that "nichrome" could mean partially oxidized. That portion of Hartig states: "The term 'nichrome' in like manner is used herein, in its

generic sense to designate a layer which includes some combination of nickel and chromium, at least some of which is in its metallic state, although same may be oxidized." That single statement in Hartig does not make it clear if the Hartig document was referring only to how others used this term in the prior art, since the quoted language appears in the "Background" section of the Hartig document, or how Hartig was using the term to describe the Hartig contribution. But, further analysis of the Hartig document answers this question. Hartig was only describing unspecified prior art!

It is inconsistent with the Hartig Summary, the Hartig Detailed Description, and the Hartig claims, that Hartig could have intended "nichrome" to mean partially but not totally oxidized in the Hartig invention, (which is the teaching necessary to support the rejection) for four reasons.

First, in the Summary and Detailed Description, Hartig never says that the nickel or nichrome layers (103, 107) are partially but not totally oxidized. Indeed, the generic statement in the "Background" is not specific as to whether "nichrome" means partially or totally oxidized. However, "partially but not totally oxidized" is necessary to meet the language of Appellants' Claims.

Second, the Hartig disclosure of that which Hartig invented (column 13, line 52-55) states that the second layer 107 of "substantially pure metallic 80/20 nichrome (or other nickel-based) layer 107 is formed in the same way as the first nickel or nichrome layer 103..." (emphasis added). Again, this is not a teaching that Hartig was interpreting nichrome as being partially but not totally oxidized. To the contrary, it is a teaching that Hartig considered nichrome to be metallic in his invention. Yet it is only in the context of the Hartig invention (with the silver layers and dielectric layers) that a rejection could be predicated on §102. (Each element of the claim must be found in a single prior art reference arranged as in the claim under review..." In re

Bond, 910 F.2d 831, 15 U.S.P.Q.2d 1556 (Fed. Cir. 1990)(emphasis added)). Thus it is not enough for nichrome to mean partially oxidized elsewhere in the patent specification unless nichrome means partially but not totally oxidized when arranged in the coating stack of the Hartig invention.

Third, the invention as claimed by Hartig (Claim 1, column 24, lines 44-52) has both of its nickel or nichrome layers deposited in an inert atmosphere. This certainly suggests that as used by Hartig to describe his invention, any nichrome means a metallic combination of nickel and chromium, and did not mean, and could not mean, a partially but not totally oxidized combination of nickel and chromium.

Fourth, Hartig discloses (but does not claim) that his layers 103 and 107 are deposited in an atmosphere which is either 100% argon or which may optionally contain 5-10% oxygen. (Hartig, column 12, lines 58-63) What would occur under the optional condition postulated by Hartig? In the section of the patent which Hartig identifies as "This Invention" (starting at column 16) Hartig discloses the power parameters for the deposition of the two nichrome layers as being 3.57 kW and 1.33 kW for the layers 103 and 107, respectively. Is this sufficient power to partially but not totally oxidize both layers 103 and 107? Nothing in Hartig expressly gives the answer, and there is no analysis in the Official Action. But, Appellants do have an answer.

To answer this question, Appellants submitted to the Examiner a copy of EP 0 657 562 a document having a priority date of November 1993, and thus being reasonably contemporaneous with the October 1993 filing date of the application which was the parent application of Hartig. The EP document includes graphs which show the amount of oxygen needed, at various power levels, to have 100% metallic sputter deposition. (Sputter deposition is the technique for depositing the layers as disclosed by Hartig.) To explain the graphs in this EP document, if the atmosphere contains more oxygen (above the line in the graph) then there will be at least some

oxidation, i.e., at least some oxide formed during deposition. Figure 1 of the EP document is a graph for titanium and Figure 2 of the EP document is a graph for zirconium.

The following table compares the power levels used by Hartig for layers 103 and 107, with the graphs of the EP document.

Power Levels from Hartig Disclosure	Below this level of oxygen in the atmosphere, at the corresponding power level from the Hartig document, the deposit will be purely metallic **(no oxidation)** titanium (EP document, Fig 1)	Below this level of oxygen in the atmosphere, at the corresponding power level from the Hartig document, the deposit will be purely metallic **(no oxidation)** zirconium (EP document, Fig 2)
3.57 kW (layer 103)	less than 17%	less than 25%
1.33 kW (layer 107)	less than 7%	less than 7%

Thus at the maximum 10% oxygen level broadly mentioned in Hartig (Hartig, column 12, lines 58-65), layer 103 would be purely metallic if titanium or zirconium were being deposited. Since it is known and undisputed that nickel and chromium are less reactive than zirconium and titanium, then even more oxygen would be needed when depositing nickel and chromium to have a partially oxidized deposit as compared with the amount of oxygen needed to partially oxidize titanium or partially oxidize zirconium. And, it is noted that while Hartig mentions the possibility of depositing in an atmosphere having up to 10% oxygen, there is no example which explains the result of the use of such an amount of oxygen. At the low power levels used by Hartig, would there be partial oxidation? It can not be reasonably disputed on this evidence that the answer is no. It can not be disputed that it is proper to consider extrinsic evidence to explain the disclosure of a reference. Scripps Clinic & Res. Found. V. Genentech, Inc., 927 F.2d 1565, 18 U.S.P.Q.2d 1896 (Fed. Cir. 1991) There just is no teaching in Hartig of partially but not totally oxidized layers. Since the lower layer 103 is not partially oxidized during deposition, the interpretation of the Hartig document in the Final Rejection is incorrect, the Hartig document does not anticipate Claim 25, and the rejection should be reversed.

D. **Rejection of Claims 36-42, 44-45 and 47-48**

Claims 36-42, 44-45 and 47-48 were rejected under 35 U.S.C. § 103 as being unpatentable over Guiselin. Each of these Claims depend, directly or indirectly from independent Claim 25. If, but only if, the Section 102(b) rejection in the Final Official Action based on this reference (See part VIII B 1, supra) is affirmed without any change whatsoever in the language as set forth in the Final Official Action and there is no rejection on any other basis, then solely for the purpose of administrative convenience in this Appellate proceeding, and without prejudice to Appellants' right to proffer reasons in support of the separate patentability of any other claim in this group at any other time, the Board's decision on Claim 25, which is an independent claim, will be dispositive as to this rejection under Section 103 as to Claims 36-42, 44-45 and 47-48.

E. **Rejection of Claim 30**

Claim 30 was rejected under 35 U.S.C. § 103 based on the combination of the Guiselin and Jenkinson documents. This Claim depends, indirectly, from independent Claim 25. If, but only if, the Section 102(b) rejection in the Final Official Action based on this reference (See part VIII B 1, supra) is affirmed without any change whatsoever in the language as set forth in the Final Official Action and there is no rejection on any other basis, then solely for the purpose of administrative convenience in this Appellate proceeding, and without prejudice to Appellants' right to proffer reasons in support of the separate patentability of any other claim in this group at any other time, the Board's decision on Claim 25, which is an independent claim, will be dispositive as to this rejection under Section 103 as to Claim 30.

F. **Rejection of Claims 30, 32-33, 60 and 69-71**

Claims 30, 32-33, 60 and 69-71 were rejected under 35 U.S.C. § 103 based on the

combination of the Guiselin and Anderson et al documents.

1. Claims 30 and 32-33

Each of these Claims depend, directly or indirectly from independent Claim 25. If, but only if, the Section 102(b) rejection in the Final Official Action based on the Guiselin reference (See part VIII B 1, supra) is affirmed without any change whatsoever in the language as set forth in the Final Official Action and there is no rejection on any other basis, then solely for the purpose of administrative convenience in this Appellate proceeding, and without prejudice to Appellants' right to proffer reasons in support of the separate patentability of any other claim in this group at any other time, the Board's decision on Claim 25, which is an independent claim, will be dispositive as to this rejection under Section 103 as to Claims 30, 32 and 33.

2. Claims 60 and 69-71

If, but only if, the Section 102(b) rejection in the Final Official Action based on the Guiselin reference (See part VIII B 2, supra) is affirmed without any change whatsoever in the language as set forth in the Final Official Action and there is no rejection on any other basis, then solely for the purpose of administrative convenience in this Appellate proceeding, and without prejudice to Appellants' right to proffer reasons in support of the separate patentability of any other claim in this group at any other time, the Board's decision on Claim 52, which is an independent claim, will be dispositive as to this rejection under Section 103 as to Claims 60 and 69-71.

G. Rejection of Claims 36-42, 44-45, 47-48, 58-59 and 67-68

Claims 36-42, 44-45, 47-48, 58-59 and 67-68 were rejected under 35 U.S.C. § 103 based on the Hartig document.

If, but only if, the Section 102(b) rejection in the Final Official Action based on the Hartig reference (See part VIII C, supra) is affirmed without any change whatsoever in the language as set forth in the Final Official Action and there is no rejection on any other basis, then solely for the purpose of administrative convenience in this Appellate proceeding, and without prejudice to Appellants' right to proffer reasons in support of the separate patentability of any other claim in this group at any other time, the Board's decision on Claim 25, which is an independent claim, will be dispositive as to this rejection under Section 103 as to Claims 36-42, 44-45, 47-48, 58-59 and 67-68.

H. Rejection of Claims 30, 60 and 69-71

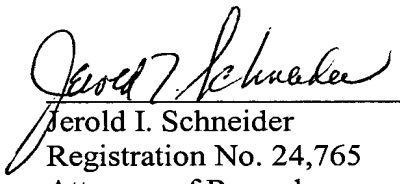
Claims 30, 60 and 69-71 were rejected under 35 U.S.C. § 103 based on the Hartig document taken in combination with the Anderson et al or Proscia documents. If, but only if, the Section 102(b) rejection in the Final Official Action based on the Hartig reference (See part VIII C, supra) is affirmed without any change whatsoever in the language as set forth in the Final Official Action and there is no rejection on any other basis, then solely for the purpose of administrative convenience in this Appellate proceeding, and without prejudice to Appellants' right to proffer reasons in support of the separate patentability of any other claim in this group at any other time, the Board's decision on Claim 25, which is an independent claim, will be dispositive as to this rejection under Section 103 as to Claims 30, 60 and 69-71.

IX. CONCLUSION

For each of the foregoing reasons it is submitted that there is no *prima facie* case of anticipation because of an erroneous interpretation of the prior art documents. The Final Rejection should be reversed in all respects.

Respectfully submitted,

PIPER RUDNICK LLP



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CLAIM APPENDIX

1-24 (Canceled)

25. (Previously Presented) Transparent substrate carrying a coating stack comprising at least one metallic coating layer comprising silver or a silver alloy, each metallic coating layer being in contact with two non-absorbent transparent dielectric coating layers, the coated substrate being adapted to withstand a bending or tempering type of heat treatment, characterized in that prior to such heat treatment, each of the dielectric coating layers comprises a sub-layer based on a partially but not totally oxidized combination of at least two metals.

26. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that one of the said two metals is Ni.

27. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that one of the said two metals is Cr.

28. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that the said combination of two metals is based on Ni and Cr.

29. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that at least one metallic coating layer of the said coating stack is in contact with at least an underlying sub-layer of an oxide of a metal selected from Ti, Ta, Nb and Sn.

30. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 29, characterized in that at least the sub-layer based on a partially oxidized combination of two metals which is closest to the substrate is in contact with an underlying sub-layer of an oxide of titanium.

31. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that the dielectric coating layer positioned between the substrate and the first metallic coating layer comprises sub-layers of metal oxides or of oxides of combinations of metals.

32. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that at least one of the two non-absorbent transparent dielectric coating layers comprises a sub-layer of at least one nitride.

33. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 32, characterized in that at least one nitride is a nitride of Si, Al, or a combination of these elements.

34. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that the at least one metallic coating layer is selected from the group consisting of silver, a combination of silver and platinum, a combination of silver and palladium, and a combination of silver, platinum and palladium.

35. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that the coating stack contains a single metallic coating layer.

36. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that the optical thickness of the dielectric coating layer closest to the substrate is between 50 and 90 nm, that of the other dielectric coating layer is between 70 and 110 nm, that of the sub-layers based on a combination of two metals is between 3 and 24 nm and the geometrical thickness of the metallic coating layer is between 8 and 15 nm.

37. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that after a tempering or bending type heat treatment the substrate has a haze of less than 0.3%.

38. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that after a tempering or bending type heat treatment the substrate has an emissivity of less than 0.08.

39. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that following a tempering or bending type heat treatment the luminous transmittance of the substrate under Illuminant A varies by less than 10% with respect to its value prior to the tempering or bending type heat treatment.

40. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that following a tempering or bending type heat treatment its color purity in reflection varies by less than 5% with respect to its value prior to the tempering or bending type heat treatment.

41. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that following a tempering or bending type heat treatment the dominant wavelength in reflection varies by less than 3 nm with respect to its value prior to the tempering or bending type heat treatment.

42. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that following a tempering or bending type heat treatment the luminous transmittance of the substrate under Illuminant A varies by less than 10%, its color purity in reflection varies by less than 5% and its dominant wavelength in reflection varies by less than 3 nm with respect to the values prior to the tempering or bending type heat treatment.

43. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that the coating stack comprises, in order, the transparent substrate, a first non-absorbent transparent dielectric coating layer, a first metallic coating layer, an intermediate non-absorbent transparent dielectric coating layer, a second metallic coating layer and a third non-absorbent transparent dielectric coating layer.

44. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 43, characterized in that the optical thickness of the dielectric coating layer closest to the substrate is between 50 and 80 nm, that of the dielectric coating layer spaced furthest from the substrate is between 40 and 70 nm, that of the intermediate dielectric coating layer is between

130 and 170 nm, that of the sub-layers based on a composition of two metals is between 3 and 24 nm and the geometrical thickness of the metallic coating layers is between 8 and 15 nm.

45. (Previously Presented) Transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that after a tempering or bending type of heat treatment the substrate has a haze of less than 0.5% and a TLA greater than 76%.

46. (Previously Presented) Multiple glazing characterized in that it comprises a coated substrate in accordance with Claim 25.

47. (Previously Presented) Laminated glazing characterized in that it comprises a coated substrate in accordance with Claim 25.

48. (Previously Presented) Vehicle windshield characterized in that it comprises a coated substrate in accordance with Claim 25.

49. (Previously Presented) Method of manufacturing a transparent substrate carrying a coating stack in accordance with Claim 25, characterized in that at least one metallic coating layer is sputter deposited in an oxidizing atmosphere.

50. (Previously Presented) Method in accordance with Claim 49, characterized in that the said atmosphere comprises less than 10% oxygen.

51. (Previously Presented) Method in accordance with Claim 49, characterized in that the said atmosphere comprises 3 to 7% oxygen.

52. (Previously Presented) Glass substrate carrying a coating stack comprising, in order from the glass substrate:

a non-absorbent transparent coating layer comprising a layer of a partially but not totally oxidized combination of at least two metals;

a metallic coating layer selected from the group consisting of silver and silver alloys;

a non-absorbent transparent coating layer comprising a layer of a partially but not totally oxidized combination of at least two metals.

53. (Previously Presented) Glass substrate carrying a coating stack in accordance with Claim 52, in which at least one of the layers which comprises a partially but not totally oxidized combination of at least two metals comprises Ni.

54. (Previously Presented) Glass substrate carrying a coating stack in accordance with Claim 52, in which at least one of the layers which comprises a partially but not totally oxidized combination of at least two metals comprises Cr.

55. (Previously Presented) Glass substrate carrying a coating stack in accordance with Claim 52, in which at least one of the layers which comprises a partially but not totally oxidized combination of at least two metals comprises Ni and Cr.

56. (Previously Presented) Glass substrate carrying a coating stack in accordance with Claim 52, in which at least one of the non-absorbent transparent coating layers comprises the layer of partially but not totally oxidized combination of at least two metals in association with a layer of a different material to that of the layer of partially but not totally oxidized combination of at least two metals.

57. (Previously Presented) Glass substrate carrying a coating stack in accordance with Claim 52, in which the entire thickness of at least one of the layers comprising a partially but not totally oxidized combination of at least two metals is partially oxidized.

58. (Previously Presented) Glass substrate carrying a coating stack in accordance with Claim 52, in which at least one of the layers comprising a partially but not totally oxidized combination of at least two metals is partially oxidized across its entire thickness.

59. (Previously Presented) A glass substrate having a haze of less than 0.5%, said glass substrate being formed in accordance with Claim 52 and subjected to a heat treatment selected from bending and tempering.

60. (Previously Presented) A glass substrate having an emissivity of less than 0.08, said glass substrate being formed in accordance with Claim 52 and subjected to a heat treatment selected from bending and tempering.

61. (Previously Presented) Glass substrate carrying a coating stack which comprises, in order from the glass substrate:

a non-absorbent transparent coating layer comprising a layer of an oxide of titanium and an overlying layer of a partially but not totally oxidized combination of Ni and Cr;

a metallic coating layer selected from the group consisting of silver and silver alloys;

a non-absorbent transparent coating layer comprising a layer of a partially but not totally oxidized combination of Ni and Cr and an overlying layer of a nitride selected from the group consisting of nitrides of silicon, nitrides of aluminum and mixed nitrides of silicon and aluminum.

62. (Previously Presented) Glass substrate carrying a coating stack comprising, in order from the glass substrate:

a non-absorbent transparent coating layer comprising a layer of a partially but not totally oxidized combination of at least two metals;

a metallic coating layer selected from the group consisting of silver and silver alloys;

a non-absorbent transparent coating layer comprising a layer of a partially but not totally oxidized combination of at least two metals;

a metallic coating layer selected from the group consisting of silver and silver alloys;

a non-absorbent transparent coating layer comprising a layer of a partially but not totally oxidized combination of at least two metals.

63. (Previously Presented) Glass substrate carrying a coating stack in accordance with Claim 62, in which at least one of the layers which comprises a partially oxidized combination of at least two metals comprises Ni.

64. (Previously Presented) Glass substrate carrying a coating stack in accordance with Claim 62, in which at least one of the layers which comprises a partially but not totally oxidized combination of at least two metals comprises Cr.

65. (Previously Presented) Glass substrate carrying a coating stack in accordance with Claim 62, in which at least one of the layers which comprises a partially but not totally oxidized combination of at least two metals comprises Ni and Cr.

66. (Previously Presented) Glass substrate carrying a coating stack in accordance with Claim 62, in which at least one of the layers which comprises a partially but not totally oxidized combination of at least two metals is a sub-layer of its non-absorbent transparent coating layer.

67. (Previously Presented) Glass substrate carrying a coating stack in accordance with Claim 62, in which at least one of the layers which comprises a partially but not totally oxidized combination of at least two metals is partially oxidized across its entire thickness.

68. (Previously Presented) Glass substrate having a haze of less than 0.5% comprising a glass substrate in accordance with Claim 62 which has been subjected to a heat treatment selected from bending and tempering.

68. (Previously Presented) Glass substrate having an emissivity of less than 0.08 comprising a glass substrate in accordance with Claim 62 which has been subjected to a heat treatment selected from bending and tempering.

69. (Previously Presented) Glass substrate carrying a coating which comprises, in order from the glass substrate:

a non-absorbent transparent coating layer comprising a layer of an oxide of titanium and an overlying layer of a partially but not totally oxidized combination of Ni and Cr;

a metallic coating layer selected from the group consisting of silver and silver alloys;

a non-absorbent transparent coating layer comprising a layer of a partially but not totally oxidized combination of Ni and Cr;

a metallic coating layer selected from the group consisting of silver and silver alloys;

a non-absorbent transparent coating layer comprising a layer of a partially but not totally oxidized combination of Ni and Cr and an overlying layer of a nitride selected from the group consisting of nitrides of silicon, nitrides of aluminum and mixed nitrides of silicon and

aluminum.

70. (Previously Presented) Glass substrate carrying a coating stack comprising, in order from the glass substrate:

a non-absorbent transparent coating layer comprising a layer of an oxide of titanium and an overlying layer of a partially but not totally oxidized combination of at least two metals;

a metallic coating layer selected from the group consisting of silver and silver alloys; and

a non-absorbent transparent coating layer comprising a layer of a partially but not totally oxidized combination of at least two metals.

71. (Previously Presented) Glass substrate carrying a coating stack in accordance with Claim 70, in which the coating stack further comprises:

a second metallic coating layer selected from the group consisting of silver and silver alloys; and

a third non-absorbent transparent coating layer comprising a layer of a partially but not totally oxidized combination of at least two metals.